

WHAT IS CLAIMED IS:

- 1 1. A substrate processing apparatus comprising:
 - 2 a fluid-providing apparatus which is stationarily arranged adjacent a surface of at least
 - 3 one blow-off outlet, said blow-off outlet provided for blowing off fluid, and
 - 4 a rotating member capable of rotating about said fluid-providing apparatus, wherein said
 - 5 rotating member comprises:
 - 6 a first rotating member comprising a main surface that opposes a substrate to be
 - 7 processed, and
 - 8 a second rotating member being connected to said first rotating member and
 - 9 rotatably driven by a rotation-driving member,
 - 10 wherein said fluid-providing apparatus and said at least one blow-off outlet are offset
 - 11 below the main surface of said first rotating member, and
 - 12 wherein said substrate is held contactlessly above the main surface of said first rotating
 - 13 member and said fluid-providing apparatus when fluid is blown off from said at least one blow-
 - 14 off outlet.
- 1 2. The substrate processing apparatus of Claim 1, wherein the amount of the offset between
 - 2 a surface comprising said at least one blow-off outlet and said main surface of said first rotating
 - 3 member is about 2 mm or less.
- 1 3. The substrate processing apparatus of Claim 1, wherein said fluid-providing apparatus
 - 2 comprises a cylindrical blow-off portion, on the surface of which said at least one blow-off outlet
 - 3 is provided, and a first seal portion for forming a non-contact seal between it and said first
 - 4 rotating member;

5 wherein said first rotating member comprises a through hole, in the center of which said
6 blow-off portion is provided, and a second seal portion that fits said first seal portion; and
7 wherein a gap is formed between said blow-off portion and said through hole, and fluid
8 flows out from the gap.

1 4. The substrate processing apparatus of Claim 3, wherein at least one shoulder portion
2 having a radius smaller than a radius of said blow-off outlet is formed on the side of said blow-
3 off outlet.

1 5. A substrate processing apparatus comprising:
2 a fluid-providing means which is stationarily arranged and on the surface of which a
3 plurality of blow-off outlets are provided for blowing off fluid; and
4 a rotating means which is capable of rotating about said fluid-providing means, wherein
5 said rotating means comprises:
6 a first rotating member comprising a main surface that opposes a substrate, and a
7 second rotating member being connected to said first rotating member and rotatably driven; and
8 wherein said plurality of blow-off outlets comprise a first blow-off outlet located in the
9 center, and at least one second blow-off outlet located about said first blow-off outlet, wherein
10 said substrate can be contactlessly held above said first rotating member by blowing off gas from
11 the first blow-off outlet, and liquid can be blown off from said second blow-off outlet to said
12 contactlessly held substrate.

1 6. The substrate processing apparatus of Claim 5, wherein one surface of said substrate is
2 cleaned by the liquid that is blown off from said second blow-off outlet.

1 7. The substrate processing apparatus of Claim 5, wherein said second blow-off outlet
2 located about said at least one first blow-off outlet comprises a plurality of second blow-off
3 outlets.

1 8. The substrate processing apparatus of Claim 5, wherein said substrate processing
2 apparatus comprises a nozzle above said rotating means and is capable of providing liquid to a
3 second surface that is opposite to said one surface of said contactlessly held substrate.

1 9. A substrate processing apparatus comprises:
2 a fluid-providing apparatus having a first and a second diameters, wherein a plurality of
3 blow-off outlets are formed on a surface of said first diameter and a first labyrinth seal portion is
4 formed on a surface of said second diameter, the fluid-providing apparatus further comprising a
5 providing port that is capable of providing fluid to at least said plurality of blow-off outlets; and
6 a rotating member being rotatably mounted to said fluid-providing apparatus;
7 wherein said rotating member comprises a main surface, in the center of which a through
8 hole is formed, wherein the surface of said first diameter of said fluid-providing apparatus is
9 located in said through hole, and said rotating member further comprises a second labyrinth seal
10 portion that fits the first labyrinth seal portion;
11 wherein a first aperture is formed in said first labyrinth seal portion, and said first
12 aperture is connected to said providing port through a first path; and
13 wherein a second aperture is formed in said second labyrinth seal portion, and said
14 second aperture is connected to a second path, and said first aperture and said second aperture
15 are spaced apart.

1 10. The substrate processing apparatus of Claim 9, wherein the fluid provided from said
2 providing port flows through said first path, said first aperture, and said first and second
3 labyrinth seal portions and flows out from a gap between the surface of said first diameter and
4 said through hole.

1 11. The substrate processing apparatus of Claim 9, wherein said second aperture comprises a
2 plurality of apertures, and said second path comprises a plurality of paths being connected to said
3 plurality of apertures, and a plurality of fluid-draining outlets are formed on the side of said

4 rotating member, and said plurality of paths extend in radial directions and connected to said
5 plurality of fluid-draining outlets respectively, and the fluid that is provided from said providing
6 port flows through said first path, said first aperture, and said first and second labyrinth seal
7 portions and can be drained out from said fluid-draining outlets through said second aperture and
8 said second path.

1 12. The substrate processing apparatus of Claim 9, wherein said substrate processing
2 apparatus further comprises a liquid-providing nozzle above said rotating member, and is
3 capable of providing liquid by said liquid-providing nozzle to a second surface that is opposite to
4 a first surface of a substrate.

1 13. The substrate processing apparatus of Claim 9, wherein said liquid-providing apparatus
2 comprises a sensor for detecting the presence of a substrate.

1 14. A substrate processing apparatus comprising:
2 a holding plane comprising a surface, on which a plurality of blow-off outlets is formed
3 and which is arranged stationary, and a main surface that rotates about said surface, and
4 a fluid-providing apparatus to provide fluid to said plurality of blow-off outlets,
5 wherein, by contactlessly holding a substrate above said holding plane by fluid that is
6 blown off from at least one blow-off outlet of said plurality of blow-off outlets, and by blowing
7 off cleaning chemical solutions from at least one blow-off outlet of said plurality of blow-off
8 outlets, one surface of the substrate that is held contactlessly is cleaned.

1 15. The substrate processing apparatus of Claim 14, wherein a gap is formed between said
2 surface and said main surface, and fluid is blown off from said gap.

1 16. A substrate processing method comprising the steps of:
2 placing a substrate above a holding plane which comprises a surface, on which a plurality
3 of blow-off outlets are formed, and a main surface that rotates about said surface;
4 blowing off inert gas from at least one blow-off outlet of said plurality of blow-off outlets
5 to contactlessly holding said substrate above said holding plane; and
6 blowing off chemical solutions for cleaning the substrate from at least one blow-off outlet
7 of said plurality of blow-off outlets.

1 17. The substrate processing method of Claim 16, wherein said surface is kept stationary, and
2 said main surface is rotated, and said contactlessly held substrate is rotated together with said
3 main surface.

1 18. The substrate processing method of Claim 16, wherein fluid is blown off from the gap
2 between the surface that is kept stationary and the main surface that is rotated.

1 19. The substrate processing method of Claim 16, and further comprising blowing off pure
2 water from at least one of said plurality of blow-off outlets for rinsing the substrate that is held
3 contactlessly, after the cleaning step of said substrate.

1 20. The substrate processing method of Claim 19, and further comprising blowing off inert
2 gas from at least one of said plurality of blow-off outlets for drying the substrate that is held
3 contactlessly, after said rinsing step.